Dynamical Studies on Species Interaction and Biomass of Mixed Pasture in South-Western China

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Dynamical studies on species interaction and biomass of mixed pasture in south-western China

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Key words : Hemarthria compressa ,Medicago sativa ,mixture , biomass , competition

Introduction The forage yields and nutritional values of mixtures with legumes and grass have been shown to be much higher than those of monocultures (Xu *et al* . , 2003) . *Hemarthris compressa* and *Medicago sativa* are two dominant species in local pastures . The competitive interaction and biomass dynamics of *Hemarthria compressa* and *Medicago sativa* have not yet been studied (Moreira , 1989) .

Materials and methods *Hemarthria compressa* and *Medicago sativa* (cv . Eureka , Beijing Baraern Seed Company) were grown alone and in mixtures in Hongya county of Sichuan province , China . Five treatments (three replicates per treatment , $10m^2$ for each plot) of this study were as follows : A (100% 75% *H . compressa*) , B (75% *H . compressa* and 25% *M . sativa*) , C (50% *H . compressa* and 50% *M . sativa*) , D (25% *H . compressa* and 75% *M . sativa*) and E (100% *M . sativa*) . As the height of vegetation comes to 35 cm , the growth of above biomass within $1m^2$ quadrat is trimmed to a stubble of 5 cm and weighed .

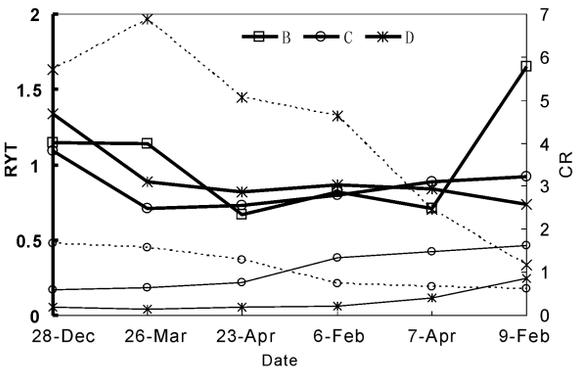

Figure 1 *Relative yield total (RYT) and competition ratio (CR) for mixtures of H compressa and M . sativa . Thick lines represent RYT and thin lines (broken lines mean CR of medicago sativa and real lines mean CR of H . compressa) represent CR . The measurements were done during* 2004 -2005 .

Results The values of relative yield total (relative to the monocultures) (RYT) ($RYT = Y_{hm}/Y_{hh} + Y_{mh}/Y_{mm}$) were higher than 1 . *Hemarthria compressa* and *Medicago sativa* with same or different eco-niches performed a specific intergrowth overyielding each other in the mixtures . Otherwise , there was a significant countergrowth yield supressionbetween both species on the treatments . The competition ratio (CR) $CR_h = (Y_{hm}/Y_{hh} \cdot Z_{hm})/(Y_{mh}/Y_{mm} \cdot Z_{mh})$ of *H . compressa* was higher than that of *M . sativa* on B treatment , and the reverse case on D treatment .

Conclusions There were the countergrowth and intergrowth between *H . compressa* and *M . sativa* on B treatment , and the countergrowth on C and D treatments . The competitiveness of *H . compressa* was more intensive than that of *M . sativa* on B treatment , and the reverse case on D treatment . In general , the treatment with the greatest growth was 75% *H . compressa* and 25% *M . sativa* .

Reference

Z . Xu , Y . W . Yu , S . H . Chang (2003) . Effect of grazing intensity on the annual productivity and composition of mixed *Lolium perenne* and *Trifolium repens* pasture . *Acta Prataculturae Sinica* . 12(5) :31-37 .